In the specification:

Please amend the paragraph at page 1, line 25 to page 2, line 7 as follows:

Several particular watermarking techniques have been developed. The reader is presumed to be familiar with the literature in this field. Particular techniques for embedding and detecting imperceptible watermarks in media signals are detailed in the assignee's co-pending application serial number 09/503,881 (Now U.S. Patent No. 6,614,914) and US Patent 5,862,260, which are hereby incorporated by reference. Examples of other watermarking techniques are described in US Patent Application 09/404,292, which is hereby incorporated by reference. Additional features of watermarks relating to authentication of media signals and fragile watermarks are described in US Patent application 60/198,138, 09/498,223 (Now U.S. Patent No. 6,574,350), 09/433,104 (Now U.S. Patent No. 6,636,615), and 60/232,163, which [~~is~~] are hereby incorporated by reference.

Please amend the paragraph at page 4, lines 6-8 as follows:

If $r(x) < r$, where r is a pre-defined reference value, the embedder increases the magnitude of x such that:

$r(x) = r$ (Block 110).

Please amend the paragraph at page 4, line 19 to page 5, line 8 as follows:

The watermarking process of Fig. 1 may be combined with another watermarking process to embed other watermarks, either robust or fragile to transformations such as sampling distortions, geometric distortions, scaling, rotation, cropping, etc. In particular, the process may be combined with an embedding process described in pending application serial number 09/503,881 (Now U.S. Patent No. 6,614,914) or US Patent 5,862,260 to encode a calibration signal that enables a detector to compensate for distortions such as scaling, rotation, translation, differential scale, shear, etc. In one

implementation, for example, the calibration signal comprises an array of impulse or delta functions scattered in a pattern in the Fourier domain of each block of image samples. To embed the pattern, the embedder perceptually adapts the calibration signal to the host image block and adds it to that block. The impulse functions of the calibration signal have a pre-defined magnitude and pseudo-random phase. To make the calibration signal less perceptible yet detectable, the embedder modulates the energy of the calibration signal according to the data hiding attributes (e.g., local contrast) of the image samples to which it is added. Preferably, the locations of the impulse functions are scattered across a range of frequencies to make them robust to transformations like spatial scaling, rotation, scanning, printing, and lossy compression. Further, they are preferably arranged to be symmetric about vertical and horizontal axes in the Fourier domain to facilitate detection after flipping or rotating the watermarked image.

Please amend the paragraph at page 6, lines 11-15 as follows:

In addition to being integrated with other watermark signal components, the process of Fig. 1 may be combined with a robust watermark embedding process to carry a multi-bit message payload carrying metadata or a link to metadata stored in an external database. Example implementations for embedding this type of robust watermark are described in pending application serial number 09/503,881 (Now U.S. Patent No. 6,614,914) and US Patent 5,862,260.

Please amend the paragraph at page 7, lines 6-18 as follows:

To make the process robust to geometric distortion, the detector includes a pre-processing phase in which it correlates a calibration signal with the potentially corrupted watermarked signal as described in ~~pending application serial number~~ 09/503,881 (Now U.S. Patent No. 6,614,914) or US Patent 5,862,260. Using a Fourier Mellin transform, the detector maps both the calibration signal and the received signal into a log polar coordinate space and correlates the signals (e.g., using generalized matched filters) to calculate estimates of rotation and scale. After compensating for rotation and scale, the

detector uses the phase information of the calibration signal to compute translation, e.g., the origin or reference point for each block. Further correlation operations may be used to compute differential scale (e.g., the change in scale in the horizontal and vertical directions after watermarking). After compensating for geometric distortion, the detector executes the process of Fig. 2 to detect alteration in the selected frequency coefficients modified according to the method shown in Fig. 1.

Please amend the paragraph at page 9, lines 1-11 as follows:

One approach to implementing a semi-fragile watermark is to embed extra signal peaks in the Fourier magnitude domain that are of varying intensity, and have the watermark decoder determine if the watermark has been scanned and printed by the relative power of the extra and original calibration signal peaks. The extra peaks refer to a set of peaks used to implement the semifragile watermark. The original calibration signal peaks refer to the ones already included in the watermark to determine its orientation in a geometrically distorted version of the watermarked signal. For an example of such a calibration signal, see U.S. Patent No. 5,862,260 and U.S. Application No. 09/503,881 (Now U.S. Patent No. 6,614,914), which are incorporated by reference. Some peaks are referred to as "extra" because they are included in addition to other peaks that form the original set of peaks in a calibration signal.